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Faking Bad in Workers Compensation Psychological Assessments: Elevation Rates of Negative Distortion Scales on the Personality Assessment Inventory in an Australian Sample

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The workers compensation system provides a clear external incentive for deliberate feigning of physical or mental illness to some individuals. Although it has been asserted that all pre-liability workers compensation psychological assessments should involve assessment of deliberate feigning, the lack of an agreed standard for assessing this response style creates a substantial challenge in practice. Over the last two decades, substantial attention has been given to measures of psychopathology that also include validated negative distortion indices. The Personality Assessment Inventory) has been validated in both the clinical and forensic population, and is reportedly used by many Australian psychologists. This study explores rates of elevation of negative distortion scales on the PAI as a potential indicator of deliberate feigning in a large Australian workers compensation sample.

Key words: Malingering Index; Negative Impression Scale; Personality Assessment Inventory (PAI); Rogers's Discriminant Function; validity scales; workers compensation.

In Australia, psychological injury claims or workplace 'stress claims' are the most costly type of workers compensation claim, across all jurisdictions (Guthrie, 2007; Safe Work Australia, 2013). Pre-liability assessments of psychological injury are conducted in the context of clear external incentives for attainment of a diagnosis of psychological disorder (e.g., financial compensation or changes in employment conditions). This both creates an opportunity for deliberate feigning of psychological dysfunction on the part of the applicant and presents a challenge to the validity of psychological assessment. There is no consensus in the literature in regard to the prevalence of deliberate negative distortion or feigning of dysfunction in such assessments. It has been argued that behaviour may be dependent on the context of the assessment and the type of condition feigned (Clifford, Byrne, & Allan, 2004; Lees-Hayley, 1997; Mittenberg, Patton, Canyock, & Condit, 2002; Slick, Tan, Strauss, & Hultsch, 2003). Recognising these issues, Rogers and Payne (2006) have recommended that workers compensation psychological assessments should routinely involve use of empirically validated malingering detection strategies to rule out feigning.

Multiscale inventories are commonly used as part of the psychological assessment within the wide domain of forensic and clinical practice (Lally, 2003; Rogers & Bender, 2003; Sharland & Gfeller, 2007; Slick et al.,

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2003). In the last decade, the Personality Assessment Inventory (PAI: Morey, 1991), has demonstrated validity in civil and criminal areas of forensic practice (Boccaccini, Murrie, & Duncan, 2006; Edens, Poythress, & Watkins-Clay, 2007; Mullen & Edens, 2008), and, in Australia, the PAI is frequently used by psychologists for assessment of psychopathology and detection of deliberate feigning (Yoxall, Bahr, & Barling, 2010). In a review of United States state, federal, and military courts and legal systems in other countries including Australia, Canada, and the United Kingdom, Mullen and Edens (2008) found that the PAI is frequently used in cases where some form of financial outcome was directly related to the diagnosis of a psychological condition, such as workers compensation.

The PAI validity scales and indices relating to negative distortion are: the Negative Impression Management Scale (NIM); the Malingering Index (MAL); and Rogers's Discriminant Function (RDF; Morey, 1991).

The NIM relies upon the malingering detection strategy of amplification of symptoms and endorsement of items that are infrequently endorsed in clinical and non-clinical populations (Morey, 1991, 2007; Rogers, 2008). The scale was developed to measure enhanced negative impression management of overall functioning; however, high elevations are considered to be an indicator of deliberate feigning (Morey, 1991). The utility of the NIM as a screening mechanism for deliberate feigning has been demonstrated in over 30 studies incorporating both psychiatric and forensic populations (for example: Blanchard, McGrath, Pogge, & Khadivi, 2003; Boccaccini et al., 2006; Morey & Lanier, 1998; Wang et al., 1997). In a meta-analysis, Hawes and Boccaccini (2009) calculated that a NIM cut score of >81T generated a hit rate of .79 (with sensitivity at .73 and specificity at .83), and demonstration of large effect sizes when comparing NIM scores generated by honest non-clinical responders and those engaging in naïve simulation (1.68), coached simulation (1.59), and when examined within known groups (1.06). Overall, the NIM appears most effective at detection of feigning of severe mental disorders (e.g., schizophrenia with a hit rate of 90%), but is not as accurate at detection of feigning of more subtle forms of mental illness such as depression (hit rate of 22% to 60%; Rogers, Ornduff, & Sewell, 1993). Other studies (e.g., Rogers, Sewell, Morey, & Ustad, 1996) have indicated that the NIM is more effective in detection of naïve simulators who endorse a global response of severe dysfunction rather than sophisticated simulators who may be more cautious about their presentation.

The Malingering Index (Morey, 1991) utilises a different detection strategy – that is, an unlikely pattern of symptoms. The index is composed of eight configural features of the PAI profile that have been frequently observed in persons simulating psychopathology (Morey, 1991). Morey (1991) suggested that a MAL score of ≥3 indicates possible feigning, and a score of ≥5 is so rare in bona fide samples that it would indicate probable feigning. This was confirmed by Morey and Lanier (1998) who reported a sensitivity of 82% and a specificity of 93% in differentiating those feigning psychopathology when using a cut score of ≥3. The Hawes and Boccaccini meta-analysis (2009) reported a hit rate of .71 when using the cut score of ≥3. This provided low sensitivity (.58) and high specificity (.86). In the same study a cut score of ≥5 demonstrated a hit rate of 70 with a low sensitivity (.28) but high specificity (.99).

To date, more than 17 studies (both known groups and simulation design) have investigated the utility of the MAL Index in both psychiatric and forensic populations (for example, Bagby, Nicholson, Bacchiochi, Ryder, & Bury, 2002; Baity, Siefert, Chambers, & Blais, 2007; Blanchard et al., 2003; Boccaccini et al., 2006; Wang et al., 1997). In their 2009 meta-analysis, Hawes and Boccaccini found the mean effect size of the MAL Index to be moderate (0.94) for simulators versus genuine clinical samples but small

(0.31) for known groups versus genuine clinical samples. The meta-analysis also reported that, like the NIM, the effect size (when using the MAL as a differentiator) was greater in studies identifying simulation of major mental illness (1.89) than simulation of more subtle conditions such as anxiety or depression (0.90).

A discriminant function derived by Rogers et al. (1996) has been the subject of some debate in the literature. In the validation studies a high hit rate of more than 80% in an initial cross-validation sample was yielded by the two-stage discriminant function analysis, which appeared independent of clinical status. However, a subsequent known-groups design study with a correctional sample found a misclassification rate of 60%. This led Rogers, Sewell, Cruise, Wang, and Ustad (1998) to warn that the RDF should not be used in forensic arenas and should only be used as a screen for deliberate feigning. However, in the last 16 years, more than 10 studies have been conducted in regard to the utility of the RDF in psychiatric populations (for example, Edens et al., 2007; Kucharski, Falkenbach, Egan, & Duncan, 2006). The general performance of the RDF in known groups design has remained poor (Hawes & Boccaccini, 2009). However, more promising results have been found in simulation studies. In addition, the complexity of the scoring derived from the discriminant function mitigates the risk of coaching. In general the cut-off for RDF is considered to be 60T, which has demonstrated reasonable sensitivity (.87) and specificity (.96; Rogers et al., 1996).

Elevation of these three scales on the PAI have been used by psychologists as a proxy for a malingering test. However, whilst the PAI has received much attention in the literature, there are few studies that explore the utility of this instrument in detection of deliberate feigning within a workers compensation sample and the rates at which the NIM, MAL, and RDF are elevated in different populations. Sumanti, Brauer Boone, Savodnik, and Gorsuch (2006) reviewed 233 profiles of pre-liability applicants in a Canadian workers compensation sample and found that the elevation rate varied between 9 to 29% of the sample, according to the measure used. The authors reported that 9% of the sample elevated the NIM (cut score of 84T); 16% of the sample elevated the MAL (cut score of 3); and 29% of the sample elevated the RDF (cut score of 60T).

Although an elevation on a validity scale is insufficient evidence to determine deliberate feigning, patterns of this type of responding can provide information regarding: (a) the frequency with which negative distortion occurs in a particular population; (b) what strategies individuals might use to distort their presentation; and (c) which individuals are more likely to negatively distort their presentation. Sumanti et al. (2006) found a moderate correlation between the NIM and MAL with 35% shared variance (p. 761), but no significant correlation between either the NIM and RDF or the MAL and RDF. The study also identified that those who elevated the NIM or MAL appeared to present in a different manner to those who elevated the RDF, namely that the former two groups appeared to demonstrate global in discriminant endorsement of clinical symptoms whereas those who elevated the RDF tended to elevate scales tapping into depression and paranoia. Thus the authors suggested that that the RDF may tap into deliberate feigning of other forms of mental illness such as depression or anxiety, which are more commonly reported in workers compensation assessments. If correct, then it is unsurprising that known-groups design studies (which have often used the Structured Interview of Reported Symptoms, SIRS; Rogers, Bagby, & Dickens, 1992, as a differentiator) have found no significant group differences in detecting simulated anxiety and or depression as the SIRS has been shown to be less effective in identification of subtle forms of mental illness (Green & Rosenfeld, 2011). It is not clear to date whether the SIRS–2 (Rogers, Sewell, & Gillard, 2010) has proved more

effective in this regard. The aims of current study are (a) to examine the rates of elevation of the NIM, MAL, and RDF in an Australian workers compensation sample and (b) to determine what patterns predict elevation of negative distortion scales/indices in a sample for whom there is a clear external incentive for a diagnosis of psychological disorder.

Method

Participants

An archival file review of consecutive forensic cases wherein a PAI had been completed as part of a pre-liability State or national workers compensation psychological assessment ($n = 806$) between 1999 and 2009 was conducted. The data were retrieved from three private psychology practices in South East Queensland and New South Wales, Australia. Files were de-identified by the psychologists who owned the data. Profiles that were deemed invalid due to elevation of the Inconsistency Scale ($\geq$73T) or the Infrequency Scale ($\geq$75T) were excluded from the sample. Data arising from short-version administrations of the PAI were also excluded because neither MAL nor RDF could be calculated from these profiles. Finally, files with missing data were excluded. Overall 757 cases were suitable for analysis.

Procedure

The study was conducted in accordance with the Australian National Statement on Ethical Conduct in Human Research (2007). Prior to commencing the study approval was obtained from Bond University Human Research Ethics Committee (BUHREC) RO-556.

Demographic data relating to age, gender, occupation, and education were sourced from the archived files. Clinical data pertaining to assessment context, presenting concern, and outcome diagnosis (by psychologist) were also sourced. Occupations were coded as per the Australian Bureau of Statistics occupational codes (Australian Bureau of Statistics, ABS, 2006). Reported work-related stressors were coded as : critical incident, bullying and harassment; psychological injury secondary to physical injury; or unreasonable management action. A proportion of cases involved the reporting of multiple and varied stressors, and these cases were coded as 'unclear' in regard to the reported stressor.

Coding was completed by the lead author, and the psychologist who owned the data and the process was overseen by a second author, who also contributed to coding. All profile data were examined using t scores from the four PAI validity scales, the 11 PAI clinical scales (and corresponding subscales), five treatment consideration scales, and the two interpersonal scales. When MAL or RDF scores were not available in profiles, these indices were calculated by the lead author. All data were analysed using SPSS (Edition 17).

Results

The mean age of individuals presenting for workers compensation pre-liability assessments was 42.24 years ($SD = 10.95$, $R = 17$–68), and the mean education was 11.35 years ($SD = 2.28$). Gender was evenly distributed, with females comprising 52.5% of the sample. Occupations varied, but covered most of the primary occupational groups as defined by the Australian Bureau of Statistics. The majority of claimants were employed in labouring or technical trades (21.2%); community or personal services (19.8%); retail and sales (13.8%); administration or clerical roles (11.3%); or management (11%). The mean age at time of reported psychological injury was 41.49 years ($SD = 10.80$). Most cases involved substantial time between reported development of condition and psychological assessment ($M = 1.2$ years, $SD = 2.26$). The mean t score for the Positive Impression Scale (49.88, $SD = 11.17$) suggested that claimants did not generally attempt to minimise concerns. The mean t score for the Negative Impression Scale

(61.35, $SD = 14.84$) indicated that most individuals demonstrated a negative view of their functioning. This would be expected in a sample of individuals claiming psychological injury arising from their employment.

Data on presenting symptoms were unavailable for most of the sample. Data on alleged work-related stressors (claimed cause of psychological injury) were available for a subsample of the group ($n = 312$). Of the cases for which these data were available, the majority of claimants reported multiple grievances (41.1%) pertaining to their psychological injury. A substantial proportion claimed that their condition had arisen as a consequence of bullying and harassment (17.3%) or critical incident (19.9%). A proportion reported that their psychological condition had arisen from unreasonable management action (6.1%). However, many individuals reported psychological injury secondary to physical injury (15.1%), an example of which would be a claim of depression developing as a consequence of a work-related back injury.

In analysis of overall elevation rates, it was found that the majority of respondents (434, or 57.3%) did not elevate any of the three negative distortion validity scales on the PAI. In consideration of the patterns of elevations across the three indices, the RDF was the index most frequently elevated (refer to Table 1). Around 10% of the sample demonstrated moderate elevation of the NIM Scale, and a similar proportion gained a score of three or more on the Malingering Index.

With the cut scores of 81T for NIM, ≥3 for MAL (as recommended by Hawes & Boccaccini, 2009), and 60T for RDF (as recommended by Morey, 2007), 233 claimants (32.1% of the total sample) elevated one validity index. Fifty-five elevated two indices (7.3% of the total sample), and 19 elevated on all three negative distortion validity indices (2.5% of the total sample).

A moderate correlation was found between the NIM and MAL, but a very small positive correlation was found between NIM and RDF, and MAL and RDF, respectively. Strong positive correlations were found between NIM and the Borderline Scale and between NIM and the Somatisation Scale. Moderate correlations were found between NIM and the Antisocial Scale and between MAL and the Borderline Scale and between MAL and the Somatisation Scale (see Table 2).

Those who elevated the NIM scale appeared to elevate multiple scales (i.e., ≥70T) – namely, SOM (Somatisation); ANX (Anxiety); ARD (Anxiety Related Disorders); DEP (Depression); SCZ (Schizophrenia); BOR (Borderline); and SUI (Suicide) – and generated low scores on scales pertaining to interpersonal dominance (DOM) and warmth (WRM). Those who elevated the MAL Index

Table 1. Elevations across NIM, MAL, and RDF.

		Sample elevated (%)
NIM	≥81T	10.7
	≥84T	9.9
	≥92T	4
	≥110T	0.4
MAL	≥3	12.3
	≥5	0.3
RDF	≥60T	31.3

Note: $n = 757$. NIM = Negative Impression Scale; MAL = Malingering Index; RDF = Rogers's Discriminant Function.

Table 2. Pearson's correlations for negative distortion scales/indices and personality scales.

	NIM	MAL	RDF	BOR	ANT	SOM
NIM	1					
MAL	.483**					
RDF	.139**	.118**				
BOR	.674**	.388**	.243**			
ANT	.420**	.274**	.205**	.526**		
SOM	.636**	.366*	.136**	.582**	.293**	1

Note: NIM = Negative Impression Scale; MAL = Malingering Index; RDF = Rogers's Discriminant Function; BOR = Borderline; ANT = Antisocial; SOM = Somatisation.
**$p < .01$ (two-tailed).

elevated the same scales except for the Borderline Scale. Those who elevated the MAL Index also generated low scores for interpersonal dominance (DOM) and warmth (WRM). In comparison, those who elevated the RDF only showed elevated scores on ANX (Anxiety) and DEP (Depression). However, scores for interpersonal dominance (DOM) and warmth (WRM) were similar to the scores in the other two groups. See Table 3 for details.

To explore the manner in which those individuals who elevated one, two, or three validity scales/indices varied as a function of presenting problem or other demographics, a discriminant function analysis was conducted. The DFA included the categories of elevation on none; elevation on one index; elevation on two indices; and elevation on three indices. Predictors were: presenting problems (critical incident; bullying and harassment; unreasonable management action; or psychological injury secondary to physical injury), age, education, and occupation.

Although the discriminant function showed a significant association between groups and predictors (see Figure 1), the amount of variance accounted for was small. Function 1 accounted for 63.3% of the between-group variance [$\chi^2(15) = 43.43$, $p < .001$, Wilks's $\lambda = .868$, canonical $R^2 = .085$]. Function 2 accounted for 26.6% of the between-groups variance [$\chi^2(8) = 16.25$, $p < .05$, Wilks's $\lambda = .948$, canonical $R^2 = .038$]. Cross-classification (leave-one-out solution) was little more than chance (34%), indicating that this solution has little utility for predicting elevation on none, one, two, or three validity indices from presenting problems, occupation, age, gender, and education.

A second discriminant function analysis was conducted to determine whether elevation on none, one, two, or three negative distortion validity indices could be predicted by scores on clinical, treatment, and

Table 3. Means and standard deviations of clinical scales (*T* scores) across elevation of RDF, NIM, and MAL.

Scale	RDF ≥60T Mean (*SD*)	NIM ≥81T Mean (*SD*)	MAL ≥3 Mean (*SD*)
Somatisation (SOM)	64.69 (12.29)	75.56 (12.11)	70.30 (13.96)
Anxiety (ANX)	70.36 (13.67)	80.60 (11.67)	77.16 (14.03)
Anxiety Related Disorders (ARD)	62.81 (14.10)	76.38 (11.96)	70.98 (14.24)
Depression (DEP)	79.33 (15.76)	88.87 (13.09)	84.95 (14.62)
Mania (MAN)	48.95 (9.99)	57.47 (10.98)	56.91 (11.82)
Paranoia (PAR)	64.62 (12.62)	68.85 (14.51)	68.95 (13.23)
Schizophrenia (SCZ)	64.29 (14.71)	78.93 (13.47)	72.69 (15.88)
Borderline (BOR)	60.98 (11.52)	70.62 (9.37)	66.09 (12.47)
Antisocial (ANT)	50.25 (9.84)	55.47 (11.30)	51.73 (11.10)
Alcohol use (ALC)	50.93 (10.35)	54.81 (13.41)	53.92 (13.62)
Drug use (DRG)	53.83 (9.20)	53.96 (10.90)	52.89 (9.30)
Aggression (AGG)	52.84 (12.18)	59.16 (14.28)	58.07 (14.48)
Suicide (SUI)	65.78 (18.97)	79.90 (20.62)	74.10 (23.10)
Stress (STR)	57.30 (11.90)	65.26 (13.12)	60.10 (13.61)
Lack of support (NON)	56.15 (13.35)	59.94 (12.95)	55.16 (13.47)
Resistance to treatment (RXR)	46.23 (9.82)	38.72 (8.84)	42.17 (10.52)
Dominance (DOM)	45.20 (11.20)	45.54 (12.19)	47.87 (12.09)
Warmth (WRM)	44.57 (11.71)	41.56 (12.18)	43.78 (13.10)

Note: NIM = Negative Impression Scale; MAL = Malingering Index; RDF = Rogers's Discriminant Function.

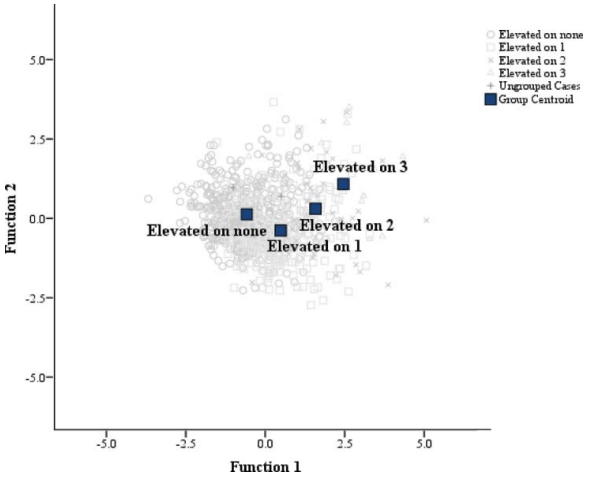

Figure 1. Discriminant function analysis plot.

interpersonal scales. A relationship between these variables can be expected to some degree given that the MAL and RDF rely on specific combinations of clinical and other scales. Significant mean differences were found for all the predictors on the dependent variable, except for the Dominance Scale. Box's M was significant, indicating that the assumption of equality of covariance matrices was violated. However, given the large sample, this was not regarded as serious.

The discriminant function showed a significant association between groups and predictors. Function 1 accounted for 85.2% of the between-group variance [$\chi^2(18) = 426.59$, $p < .001$, Wilk's $\lambda = .560$, canonical $R^2 = .379$]. The first function maximally separated those who did not elevate any of the negative distortion validity scales/indices from those who did elevate. Those who elevated the validity indices tended to report greater levels of symptoms usually associated with major mental illness (e.g., Schizophrenia Scale; Paranoia Scale; Depression Scale; Suicide Scale; and Aggression Scale). In contrast to those who did not elevate the negative distortion validity scales/indices, those who elevated tended to be more resistant to the prospect of engagement in treatment (Resistance to Treatment Scale) and reported more anxiety (Anxiety Scale).

Function 2 offered limited enhancement, accounting for 13% of the between-group variance [$\chi^2(18) = 75.25$, $p < .001$, Wilk's $\lambda = .903$, canonical $R^2 = .085$]. Function 2 maximally separated those who elevated on three indices from the rest of the sample. Those elevating on three indices tended to endorse higher ratings of overt symptoms of mental illness such as paranoia and depression. Table 4 contains details of the significant factors.

Sixty-two percent of the original group cases were correctly classified, and 58.4% of cross-validated cases (leave-one-out solution) were correctly classified (where chance would be 25%), indicating that the DFA solution has some utility for prediction of elevation on one, two, or three negative distortion validity indices on the PAI.

In general, the group that elevated two or more indices showed significantly larger mean scores across clinical scales – that is, they presented a more florid and multifaceted picture of clinical symptoms. Details can be found in Table 5.

In this sample of workers compensation claimants, those who elevated on three validity indices tended to present with lower warmth, and to report higher levels of stress, suicidal ideation, and alcohol abuse, and lower levels of social support. This group

Table 4. Standardised canonical discriminant function coefficients.

	Function 1	Function 2
Somatisation (SOM)	.092	–.052***
Anxiety (ANX)	.117	–.312***
Anxiety related disorders (ARD)	.023	.206***
Depression (DEP)	.293	–.770***
Mania (MAN)	.049	.272***
Paranoia (PAR)	.496	–.436***
Schizophrenia (SCZ)	.229	.930***
Borderline (BOR)	–.003	–.189***
Antisocial (ANT)	.218	–.100***
Alcohol use (ALC)	–.114	.232
Drug use (DRG)	.120	–.303
Aggression (AGG)	.024	.016
Suicide (SUI)	.281	.563
Stress (STR)	–.228	.250
Lack of support (NON	.006	–.197
Resistance to treatment (RXR)	.395	–.028
Dominance (DOM)	.059	.048
Warmth (WRM)	–.100	–.055

*** $p < .001$.

also scored higher on scales measuring personality dysfunction (namely, borderline and antisocial traits) and reported more psychotic symptoms. Depression, anxiety, and somatisation symptoms were also endorsed at a much higher level.

Discussion

In the current archival review study, rates of elevation of the negative distortion validity scales/indices of the PAI in a large Australian sample of workers compensation claimants were examined. Consistent with the findings of the Sumanti et al. (2006) study, which explored elevation rates of the same indices in a Canadian workers compensation sample ($n = 233$), the current study found that negative distortion elevation rates in the Australian sample varied between 9% to 31% dependent on the scale or index used. The RDF was most frequently elevated, in approximately one third of those presenting for assessment. The reason for this remains unclear, although could simply be the result of use of the standard cut score of 60T (Morey, 1991), which is only one standard deviation above average. Indeed Edens et al. (2007) argued that the use of a cut-off of 70T for the RDF is a more cautious and appropriate measure of deliberate feigning.

Another possibility is that the RDF taps into more subtle forms of deliberate feigning such as the feigning of anxiety and depression. On average, those who elevated the RDF also elevated the scales pertaining to general anxiety and depression, but did not elevate the scale tapping into suicide or the other scales pertaining to more extreme or florid psychopathology, as was the pattern for those who elevated the NIM or the MAL. This pattern appears to be consistent with the patterns identified by Sumanti et al. (2006) and lends further support to the argument that the RDF may be particularly sensitive to those feigning depression and general anxiety rather than more severe mental illness. This could be particularly useful in contexts where it is likely to be more socially acceptable and appropriate to feign more common and milder forms of mental illness such as workers compensation. Put simply, it is unlikely that those attempting to feign psychological injury in the workplace would be motivated to feign psychotic symptoms or other symptoms, including suicidality, that may be otherwise interpreted as extreme mental illness.

The current study found that while a small proportion of those presenting for workers compensation assessment appear to elevate two (7.3%) negative distortion indices, an even smaller proportion will elevate all three of these validity indices (2.5%). These individuals are statistically different to the remaining 92% of the population and should prompt further investigation. It is possible that elevation combinations may provide some increased accuracy in detection of deliberate feigning on this measure.

A moderate correlation between the NIM and MAL is not surprising given the fact that

Table 5. Means and standard deviations of clinical scales (*T* scores) across total sample, no elevation, and 1, 2, and 3 scales/indices elevations.

Scale	Total sample ($n = 757$) Mean (*SD*)	No elevation ($n = 434$) Mean (*SD*)	1 index ($n = 243$) Mean (*SD*)	2 indices ($n = 55$) Mean (*SD*)	3 indices ($n = 19$) Mean (*SD*)	*F*
Somatisation (SOM)	61.38 (12.87)	57.83_{a} (11.64)	64.05_{b} (12.03)	72.84_{c} (12.50)	76.41_{c} (14.02)	43.58^{***}
Anxiety (ANX)	65.71 (14.75)	61.21_{a} (13.74)	69.28_{b} (13.21)	79.38_{c} (12.38)	82.83_{c} (12.56)	50.92^{***}
Anxiety Related Disorders (ARD)	59.48 (14.39)	55.40_{a} (13.02)	62.10_{b} (13.31)	72.78_{c} (13.98)	78.98_{d} (11.63)	50.17^{***}
Depression (DEP)	72.50 (16.73)	66.85_{a} (15.25)	77.60_{b} (15.42)	88.18_{c} (12.01)	92.48_{c} (13.52)	60.65^{***}
Mania (MAN)	48.69 (10.12)	47.13_{a} (9.21)	48.87_{a} (10.20)	56.07_{c} (10.21)	59.83_{c} (12.34)	22.54^{***}
Paranoia (PAR)	57.49 (12.97)	52.40_{a} (10.58)	62.39_{b} (11.69)	70.41_{c} (11.82)	76.00_{d} (15.64)	86.66^{***}
Schizophrenia (SCZ)	59.42 (14.60)	54.73_{a} (12.42)	62.01b (13.01)	75.99c (13.39)	85.75d (13.37)	80.71^{***}
Borderline (BOR)	56.54 (11.87)	52.57_{a} (10.32)	59.64_{b} (11.04)	68.61_{c} (10.35)	74.03_{d} (9.58)	68.49^{***}
Antisocial (ANT)	47.72 (8.62)	45.76_{a} (7.11)	49.16_{a} (8.75)	53.28_{b} (10.00)	58.95_{c} (14.80)	30.89^{***}
Alcohol use (ALC)	50.44 (10.57)	49.80_{a} (10.16)	50.34_{a} (10.10)	53.67_{a} (12.73)	58.73_{b} (14.95)	6.22^{***}
Drug use (DRG)	51.61 (8.64)	50.30_{a} (7.99)	53.26_{ab} (8.78)	53.28_{ab} (9.87)	56.19_{b} (12.00)	9.24^{***}
Aggression (AGG)	49.80 (12.09)	46.99_{a} (10.44)	51.68_{a} (12.11)	58.82_{b} (13.92)	63.82_{b} (14.62)	32.03^{***}
Suicide (SUI)	60.03 (18.48)	55.03_{a} (15.51)	62.71_{b} (17.89)	76.26_{c} (20.85)	92.76_{d} (13.61)	56.60^{***}
Stress (STR)	55.63 (11.65)	53.77_{a} (10.69)	56.58_{a} (11.57)	62.09_{b} (13.89)	67.01_{b} (12.75)	16.88^{***}
Lack of support (NON)	50.61 (11.78)	47.20_{a} (9.53)	53.81_{b} (12.18)	57.90_{b} (14.38)	66.21_{c} (11.71)	42.12^{***}
Resistance to treatment (RXR)	46.98 (10.53)	48.52_{c} (10.64)	46.09_{bc} (9.54)	41.54_{ab} (10.75)	38.92_{a} (9.85)	12.85^{***}
Dominance (DOM)	47.15 (10.96)	48.06_{a} (10.49)	45.87_{a} (11.28)	46.47_{a} (12.14)	44.62_{a} (12.58)	2.51
Warmth (WRM)	48.80 (12.11)	51.51_{c} (11.66)	46.55bc 11.06	42.28b 13.03	34.95_{a} (10.64)	25.96^{***}

Note: For all *F* ratios, $df = (3, 744)$,
$^{*}p < .05$; $^{**}p < .01$; $^{***}p < .001$. Groups with common subscripts are not significantly different at the .5 level using Tukey's *b*.

the NIM score contributes to the calculation of the MAL (Morey, 1991), and this result is consistent with that found by Sumanti et al. (2006). Edens et al. (2007) reported a larger correlation ($r = .80$) in a general population of prison inmates in the United States. In the current study a very small correlation was found between RDF and MAL or NIM, respectively. Again this is consistent with the findings of Sumanti et al., although again Edens et al. found a larger correlation (NIM to RDF, $r = .41$; MAL to RDF, $r = .43$). Again, this lends support to the argument that RDF is tapping into a different pattern of responding than that detected by the NIM or MAL.

The current study also found a moderate positive correlation between NIM and the Borderline Scale and NIM and the Somatisation Scale, suggesting that those who present with personality dysfunction may well elevate this validity scale. A small to moderate correlation was found between NIM and the Antisocial Scale and between MAL and the Borderline Scale and MAL and the Somatisation Scale. Collectively this suggests that caution should be exercised when interpreting elevation of these negative distortion indices where personality disorder is present.

In the current study, particular attention was given to those within the workers compensation sample who elevated on single or multiple negative distortion validity scales. Two discriminant function analyses were conducted to explore the characteristics of individuals that elevate no negative distortion validity indices to those who elevate one, two, or three validity indices. In the first DFA, demographics such as gender, age, education, occupation, or factors such as presenting problems did not predict elevation of negative distortion validity indices. These variables do not appear to be good predictors of who is or is not likely to negatively distort their level of functioning. However, as noted above, endorsement of clinical, treatment, and interpersonal scales did offer some utility in predicting these categories of elevation. Of most interest were those who elevated three indices. The DFA indicated that these individuals are most likely to respond to the PAI items in such a manner as to demonstrate low warmth, high suicidal ideation, high stress, and substantial psychotic features, to report limited social support, and to endorse items to reflect substantial anxiety and depression. Furthermore, those who elevated three validity indices also elevated scales tapping into dysfunctional personality traits.

In short, it would appear that extreme amplification of symptoms, and indiscriminate endorsement of symptoms across multiple types of symptoms, is the approach taken by these individuals in distorting their presentation. Potentially this reflects a stereotypical view of mental illness wherein global dysfunction and gross and overt symptoms are assumed to be features of a psychological injury.

The sample size of the current study is large (in fact, larger than any other published study on elevation rates of validity indices), but in an archival file review of this type there is no method of ascertaining which individuals in the sample were deliberately feigning and which were responding in an honest manner. Whilst we can surmise that elevation on three validity scales may indicate deliberate feigning, there is no way to test this hypothesis with the available data. Studies of elevation rates of validity indices can only provide information about elevation rates of indices, which may or may not indicate deliberate feigning. Validation of the findings requires further investigation via other methods such as simulation studies and validation of refined instruments against known clinical samples. This validation work has been commenced and reported elsewhere (Yoxall, 2011).

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